

The logo for ASCO 2024, featuring the text "ASCO 2024" in a bold, yellow, sans-serif font.The logo for Gustave Roussy Cancer Campus Grand Paris, featuring the text "GUSTAVE ROUSSY" in a large, white, sans-serif font, with "CANCER CAMPUS GRAND PARIS" in a smaller font below it, and a stylized graphic of a building or structure to the right.

PRESS RELEASE

ASCO 2024 - Clinical Science Symposium

Villejuif, 4 June 2024

VIRTUAL BIOPSY: IA CAN BE USED TO MAP THE RESPONSE OF TUMOUR LESIONS TO IMMUNOTHERAPY

Immunotherapy is a revolutionary treatment for certain cancers. The problem is that not all patients respond to this therapeutic class. There are no 100% reliable markers to distinguish in advance between responders who will benefit from such treatment and non-responders for whom immunotherapy would be unnecessary. Against this backdrop, Gustave Roussy's research physicians have recently shown in patients with metastatic lung cancer that the CD8 radiomic signature, identified by imaging coupled with artificial intelligence, appears to be a predictor of tumour sensitivity to immunotherapy. These results were presented to ASCO on 4 June 2024 at a clinical science symposium by Dr Roger Sun, a radiotherapist oncologist at Gustave Roussy. They may help to better select patients with lung cancer who are candidates for immunotherapy.

Abstract no. 2511 presented orally by Dr Sun on Tuesday 4 June at 8:36 a.m. UTC-5.

This oral presentation is one of the 135 presentations on the agenda for this 2024 edition of ASCO, in which Gustave Roussy's research physicians took part, including 29 oral presentations. Gustave Roussy is present in many fields of expertise, attesting to the quality of the research carried out there and its international recognition.

The aim of this work is to see how an artificial intelligence tool applied to imaging can predict response to immunotherapy and patient prognosis to guide treatments.

The CD8 radiomic signature is obtained using CT imaging to map all cancerous lesions in a single patient, coupled with an artificial intelligence algorithm to measure lymphocyte infiltration of lesions.

"In 2018, we developed a radiomic signature of cancerous lesions capable of measuring lymphocyte infiltration, by coupling imaging to a specific algorithm. Measurement of this infiltration is important: the more lesions are infiltrated by lymphocytes, the stronger the response to immunotherapy will be," said Dr Sun.

Several studies have already validated the benefit of radiomic signature, particularly in melanoma and other cancers. At the patient level, it has been determined that the "coldest" lesions are least infiltrated by CD8 cells, while the "warmest" lesions are the most infiltrated.

In lung cancer, between 20 and 40% of patients respond to immunotherapy. Currently, biological markers such as PDL1, mutation load, or microsatellite instability (MSI) on chromosomes, measured in tumour biopsy samples, provide an evaluation of response to

immunotherapy. These markers, however, lack precision and are only valid for the biopsied lesion, whereas tumour lesions are generally heterogeneous.

The study presented at ASCO included 188 patients with metastatic lung cancer: 20% of these patients were naive to any treatment, 30% had received a single line of treatment, and 50% had received two. All patients were then treated with immunotherapy, Durvalumab at a dose of 10 mg/kg every 2 weeks for 12 months or until disease progression. In these 188 patients, the radiomic signature of 1,137 lesions was analysed in order to predict response to treatment.

The researchers then compared the prediction of response to immunotherapy by radiomic signature for each lesion with the actual response at treatment. A perfect correlation between prediction and reality is equal to 1, a random correlation is 0.5. The results of the study conducted on these 188 patients show that the correlation obtained is in the range of 0.59 to 0.66.

Currently, the prediction of response to immunotherapy is based on conventional markers, PD1, PDL1. And this is also of approximately 0.6. However, with the radiomic signature, biopsies are not necessary, the measurement of the response concerns all lesions and not just a biopsy and, moreover, it is a non-invasive examination.

"Moreover, this study confirms the results of previous studies indicating that the infiltration level of a patient's coldest lesion – like a barometer – help to estimate their prognosis. Additionally, we are showing, for the first time, that the signature is particularly interesting for liver damage, adds Dr. Sun. For liver lesions, we were able to identify cold lesions and hot lesions. Our study suggests that patients with cold liver lesions have a poorer prognosis, unlike those with hot liver lesions, who have a comparable prognosis to patients without liver lesions". This technique also appears to be of use in ultimately better characterising liver metastases and patient prognosis. This work paves the way for better prediction of response to immunotherapy, thanks to CD8 radiomic signature, in patients with metastatic lung cancer.

Abstract no. 2511 - CD8 Radiomics Signature to assess Inter-Lesion Spatial Heterogeneity and cold liver lesions in Advanced Non-Small cell lung cancers treated with Durvalumab - Clinical science symposium – Tuesday 4 June 2024 | 8:36 a.m. UTC-5.

Background on Gustave Roussy

Ranked as the leading French and European Cancer Centre and fourth in the world, Gustave Roussy is a centre with comprehensive expertise and is devoted entirely to patients suffering with cancer. The Institute is a founding member of the Paris Saclay Cancer Cluster. It is a source of diagnostic and therapeutic advances. It caters for almost 50,000 patients per year and its approach is one that integrates research, patient care and teaching. It is specialized in the treatment of rare cancers and complex tumors and it treats all cancers in patients of any age. Its care is personalized and combines the most advanced medical methods with an appreciation of the patient's human requirements. In addition to the quality of treatment offered, the physical, psychological and social aspects of the patient's life are respected. 4,100 professionals work on its two campuses: Villejuif and Cheilly-Larue. Gustave Roussy brings together the skills, which are essential for the highest quality research in oncology: 40% of patients treated are included in clinical studies.

For further information: www.gustaveroussy.fr/en, [X](#), [Facebook](#), [LinkedIn](#), [Instagram](#)

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